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PORTLAND ROSE FESTIVAL ELECTRICAL FEATURES

BY F. D. WEBER.

The Rose Festival is an annual event at Portland, Oregon. This year it was held on June 9, 10 and 11. On the last night, June 11th, the electrical parade was an important feature. The larger floats were erected on flat car bodies and propelled by electric motors, current for these and the illumination being taken from the 600 volt trolley of the Portland Railway, Light & Power Company.

Electrical Illumination at Portland.

The Rose Festival Committee had decided not to have an "electrical parade" this year, due to a lack of funds and the general depression along business lines. When the Portland Jovian League heard that the electrical parade had been omitted from the program they immediately appointed a committee to wait upon the Festival Committee and urge them to reconsider their action in abolishing the most important and spectacular feature of the festival. The committee's efforts were successful, but the responsibility for producing the parade was placed upon the Portland Jovian League.

The League gave a benefit show to raise funds to handle same and add new and original features of their own. These floats were "The Throne Car of Jove" and a "Caldron" float. Most of the floats in the parade had been used the year before with some additions and changes. Beside the Jovian floats there were two new ones, called "The Whole World Would Know the Portland Rose," and the "Human Rosebud."

The formation of the electric parade and the make-up of the different sections follows:

Section 1—Director of Parade, F. W. Hild; police guard; police band; premier float of the Jovian Order (150,000 volts) E. W. Whitney, chairman, with the following members of

the Jovian Order: Statesman, Tribunes, Jupiter, Neptune, Pluto, Vulcan, Mercury, Apollo, Hercules, Mars; Jovian joy float (10,000 amperes), R. Skeen, chairman; 15 Jovian Imps; special Jovian squad, S. C. Jaggar, chairman, 150 Jovians in various live wire stunts.

Section 2—Commercial section (all electrically illuminated electric vehicles), electrical jobbers, float (a) (past); electrical jobbers, float (b) (present); float, Albers Bros.; float, Townsend Creamery Company; float, Northwestern Electric Company; float, Pacific States Electric Company; float, F. C. Riggs Company; float, City Market Ice & Coal Company; float, Portland Railway, Light & Power Company.

Section 3 — Illuminated fire truck (Portland Fire Department.)

Section 4—Firemen's band (electric vehicle illumination). Floats escorted by firemen; float, "The Whole World Knows the Portland Rose"; float, "The Red Man's Land"; band (illuminated by electric automobile) float, "Discovery of the Great Northwest"; float, "The Fur Traders"; band, (illuminated by electric automobile); float, "Westward Ho!"; float, "Pioneer Days"; band, (illuminated by electric automobile); float, "Garden of the Queen" (with escort of Rosarians); decorated and illustrated automobiles for princesses and maids of honor; float, "Autumn in the West"; float, "Rose Time, June Time, Good Time—Portland"; women's band; float, "Winning the West"; float, "Romance of Commerce"; Red Cross band (illuminated by electric automobile); float, "Harnessing the Waters"; float, "Wealth of the Forest"; band (illuminated by electric automobile); float, "Roses Fragrant, Roses Rare, Roses, Roses Everywhere"; float, "Monarch of the Columbia"; band, (illuminated by electric automobile); float, "Blossom Time"; float, "Portland's Rosebuds," and float, "Panama-Pacific 1915."

The following graphic account from one of the local papers tells of the popular appreciation of Jovian efforts:

The parade was electrical in every detail. The Jovians attended to that. Instead of the flaring oil torches of former years the band was supplied with light by means of electricity produced by storage batteries carried in delivery wagons, one wagon behind each band.

Even the automobile in which Captain Moore and his lieutenants covered the route at the right of the line was lighted with electricity.

F. W. Hild, Festival director in immediate charge of the parade, had an electric automobile delicately lighted with small incandescent globes and neatly decorated with flowers.

Captain Inskeep led the platoon of police officers, following which came the police band, each man with a tiny electric lamp glowing from his cap. A group of bedeviled Jovians danced about them.

The Jovian League, which had pledged itself to supply the "life" for the parade, more than made good its most encouraging predictions, and the yells of delight which greeted its features as the parade passed through the street testified to the public appreciation.

The leading float was the throne car of Jove, and a jolly old graybeard Jove it was who sat on a crimson lighted throne between an infernal looking unicorn and a hippogriff and bantered the crowd along the way.

In front of him two red demons beat sparks from a strip of steel on an anvil and Vulcan, graybearded as Jove himself, melted cold steel in a tank of water. An attendant demon took the red-hot brands of steel from his hands and waved them about, describing fantastic circles of fire.

The car was lighted with uncanny red lamps, as indeed were all of the floats of the Jovians. And all around about the street darted red-garbed demons with pitchforks and other infernal implements of torture, snatching their prey from the crowd wherever they might. Some of the demons had bobbing red tails in the tips of which winked and blinked fires.

The great production of the Jovians and the one which captivated the crowd was the derrick float and furnace which followed the car of Jove.

In the midst of the car flamed and smoked a hellish pit tended by a murky demon who clamored loudly amid the smoke for attendants to bring on more victims. On the rear was set a great revolving crane, picked out in lines of blood-red incandescent lights.

Confederates of the demons dressed in the garb of ordinary citizens, so that many of them might have been mistaken for mere spectators, "planted" themselves in the crowd, whence they were haled at intervals by the demons and rushed up to the crane.

Vainly they shrieked and struggled. The hook of the crane was fastened in the waistband of the victim and up he went, wriggling and whirling like a fish on a line. Round would swing the crane and down would drop the victim out of sight in the flaming pit, while the demons danced about and yelled with a delight that was only surpassed by the delight of the crowd. Again and again the "stunt" was repeated all along the line.

Sometimes, by way of variation, they would send up a dummy on the crane with the live victim, and the struggles of the latter would make the dummy writhe about in a most life-like manner.

Suddenly, amid gasps and screams from the women in the crowd, the dummy would slip from the hook, crash down to the pavement and lie motionless. The demons, apparently sobered, by the accident, would dash up to the prostrate body and begin a series of first-aid "stunts" that would keep the crowd horrified and deluded until the dummy was picked up at last and flopped about so that everybody could see that he had been hoaxed.

Behind each band ran a service car, lent by Meier & Frank, carrying the storage batteries and connections, and from the service car wires were carried forward to clusters of incandescent lights borne on staves by attendants, furnishing plenty of light for the musicians. This eliminated the old flaring gasoline torches that had been used in previous years and made the parade an electrical feature in every detail.

The Morrison Electric Company had a tiny electric chariot entered. It was drawn by two electrically illuminated swans, and in it sat little Irving Jaggar as driver.

The submarine float, which had been entered by the Packard Company in the floral parade, reappeared also decked out with edgings of electric light and whizzed erratically about the streets, bumping the clowns that went along with the parade and startling the people on the sidelines with apparently desperate lunges at them.

Cannon Beach's clam-shell car was out again, a thing of beauty, with each of the big starfish that were fixed on its wheels and body illuminated with tiny electric lights within.

Albers Bros., the Portland electric jobbers and other companies, had beautifully illuminated floats in line in the division that preceded the main section of historic and symbolic Festival floats.

The Jovians brought out the old horsecar that used to run on Thirteenth street years ago, and put a gigantic papier mache conductor on its platform, who jigged about to the music and winked at the crowd with big electric eyes. The car carried a "Hayseed Band," which the Jovians had dug up, and along the route this band would hop off the car and play with feeling, "How Dry I Am" and ditties of a similar touching nature.

Floats in Portland Rose Festival.

The design of the decorations in the streets and the "festival center" were designed and erected under the personal supervision of Harold L. Wold, landscape gardener Reed College, Portland, Oregon. The following committee acted as a body of consulting electrical engineers and gave all aid and advice for "the good of the cause." R. F. Monges, F. D. Weber, F. H. Murphy, R. S. Carroll and G. N. Barker.

All of the installation work was done by day labor under the direction of Mr. Wold. Funds being limited every known method was used to make as much showing for the money as possible.

The special decorations extended over twenty city blocks. The total number of lamps in use was 7200, together with 100 four-light cluster "skedoodle" socket plug combinations. Nine thousand feet of streamers made of single conductor stranded No. 12 rubber covered wire were used. The sockets used were P. & S. No. 464 "pin point" contact type, spaced from 4 inches up to 24 inches on centers. In combination with this there was used 3000 yards of "cedar roping," together with 150 hanging flower baskets. Most of the lamps used were 16 c.p. carbon lamps, colored as follows: 2500 red, 250 blue, 250 amber, 400 green, 3800 frosted white, also 150 cloth pendants in red and white were used. All the electrical material was furnished by the Pacific States Electric Company, Portland, Oregon. The official colors for the Rose Festival were red and white. In addition to the above material the "floral center" was decorated and illuminated by the use of 2000 feet of additional electrical streamers.

The following method was employed for the street decoration:

Four 3-16 in. galvanized steel stranded messenger cables were stretched over the streets, two on each side for the twenty blocks, being suspended on insulated 5-16 in. galvanized steel stranded span wires, located 6 feet above the trolley wires and spaced every 100 feet. This construction is of a permanent nature and will be left in the street for future use. Along these streets, a system of boulevard cluster lamp posts had been installed as a permanent decorative lighting fea-

The Throne of Jove.

ture previous to the festival and these were worked into the new decorative scheme by painting them white and replacing the lights in the top globe of the cluster lights, with a four cluster "skedoodle" plug combination. The colors used being blue, amber, green and red. There being 3 lamp posts on each side of the street per block. From each cluster lamp post, electrical streamers were attached with "suspension cleats" and "polo snaps" (harness snaps) combinations. From this point the electrical streamers were

run up to the outside messenger wire a distance of 18 feet, where it was connected to the main streamers. Then the streamer was "zig-zagged" back and forth between the two messengers, on one side of the street. For all attachments the "suspension cleats" and "polo snaps" were used, being spaced 10 feet apart.

A definite color scheme was followed out. From the corner cluster pole to messenger and two-thirds of the distance to center of the block was equipped with frosted white lights, and one-third of the distance, on each side of the center of the block, including the drop of the center cluster lamp post, was installed in ruby red lamps. This combination was repeated for the entire 20 blocks. Flower baskets were attached to all cluster lamp posts and from both outside messengers, and three pendant cloth flags were hung from every trolley span wire. The street intersection streamers were treated in a similar manner in proportion to their length.

An "electrical curtain" in three colors with 700 lights was installed at one end of the system, and a canopy of two colors, with 600 lights was erected at the turning point from the street into the "festival center," which was located on several blocks of a city park. On this "curtain" there were suspended five electrical lanterns, constructed with satin linings, which threw out the light from a "skedoodle" light combination in a most effective manner. High up over the street, about half way between the "curtain" and the "canopy" was hung an immense "electrical diamond" made of tinsel and lights, on which the searchlights of the electrical parade were played.

All of the "cedar roping" was attached and suspended in a similar manner to the messengers, as the electrical streamers. The use of the messengers, allowed all this decoration to be placed in the street without interfering in any way with the trolley system and made the street appear long without obstruction to any of the special decorative features. The looping of the streamers automatically adjusted themselves because of the snap method of attachment to the messengers. All of the street decorations were fed from the lighting system of the Portland Railway, Light & Power Company, through a temporary feeder system, which cost the Rose Carnival Association $520. The three nights' consumption of the system was approximately 350 kw.-hr., the cost of which was donated by the Portland Railway, Light & Power Company.

The following is a summary of the cost of the decorations as near as can be arrived at from the Rose Festival records. It is possible some "overhead" should be added to these figures—likely 10 per cent.

The figures include cost of labor and material, together with the cost of assembling, erection and dismantling. The messenger system being left in the street as a permanent piece of construction:

Cost per block of everything except enumerated below, $112, and 20 blocks	$2240
Feeders, $26 per block and 20 blocks	520
Canopy	340
Curtain	300
Flags, $10 per block and 20 blocks	200
Cedar Piping, $7.50 per block and 20 blocks	150
Total	$3750

The total cost of the "floral center" where streamers were erected of about 2000 feet in length, was $850. Labor was paid as follows: Union linemen, $4.50 per day; electricians, $4.50 per day; helpers, $3.50 per day.

The Oregon Building Record printed the following the day after the parade.

"Portland's 1915 Rose Festival closed Friday night with the 'Electrical Parade,' a feature which was this year taken in hand by the Portland Jovian League, an organization of Portland's electrical men, and in the closing there is glory and to spare for every member of the electrical fraternity who gave so much time and work to the brilliant night pageant.

"With very little funds to work with and only the few weeks preceding the Festival in which to make preparations, it is little enough to say that the Jovians made good to an astonishing degree. Each and every one who gave of his time and labor is deserving of great credit. They saved the electrical parade, a feature that made a fitting climax to a program that has never been equalled in Portland's Festival history. And they not only saved it for ourselves and our visitors for this year's merrymaking, but logically and rightfully are entitled to take charge of the electrical parade for the 1916 Festival celebration.

"That the Festival Board yet to be elected to handle next year's program will make such disposition of the final parade of the great pageants is almost certain. It could hardly be otherwise in the light of the success the Jovians made of that feature this year. And with more time in which to work, more funds with which to do with, and the experience gained in the various details for 1915's celebration, it is safe to assume that the electrical fraternity would give an even better accounting of their stewardship in the coming year.

"There are too many deserving of credit for the success of this pageant to mention individuals. But to one and all of the men who participated in the arrangements, the Building Record certainly voices the opinion of all Portland in a salutary: Hail to the Jovians!"

In spite of "jitney competition" the Portland railway, during the three days of the festival, carried 1,045,000 passengers. Taking the average of three days' traffic at this season of the year, the estimated increase shows 391,000 as the number of passengers carried on account of the Rose Festival. Friday, the last day of the festival, the traffic was almost double the normal.

The executive is charged with the supervision of two distinct classes of work. One involves planning, the other execution. They are entirely unlike and call for different treatment. The importance of planning is gradually increasing as undertakings grow in size and ever tend to become more and more complicated. It is now recognized that achieving success is essentially a thinking job. But who is to attend to all this investigation and study? The man on the firing line has not the time. Yet if a business, like an individual, is going to "make its head save its heels" there must be men specifically charged with the task. Such men are said to belong to the "staff" or directing branch of industry, as contrasted with the "line" officials, who comprise that part of the organization which carries on the work at first hand, exercising authority, maintaining discipline, and getting the day's work done.—E. C. Church.

CONSTRUCTION OF THE TRANSCONTINENTAL TELEPHONE LINE.

BY D. P. FULLERTON.

Telephone transmission was made possible between New York and Chicago in 1892. The limits were gradually extended until the first real work on the transcontinental line was completed during the early part of 1911 when the lines of the American Telephone & Telegraph Company were extended between Omaha and Denver and service was established between New York and Denver. The lines of the Mountain States Telephone & Telegraph Company at that time extended from Denver west to Salt Lake City, a distance of approximately 700 miles, but their character unfitted them for the extension of transcontinental telephone transmission. The lines of the Pacific Company extended eastward from San Francisco to Wadsworth, Nevada, a distance of 271 miles. Between Wadsworth, Nevada, and Salt Lake City, there was a gap of 525 miles in which it was necessary to place poles and wires before transcontinental telephony became possible.

We were advised as early as 1911 that the developments by the engineers of the American Telephone & Telegraph Company had reached a point where it was felt certain that within a very short time transcontinental service would be established, and during the summer of 1913 instructions were given to begin the necessary engineering and surveying with a view to closing the gap and rearranging the existing lines in the terrirory between Denver and San Francisco.

The real work of developing through transcontinental service consisted in re-transposing and readjusting the existing circuits to meet the conditions imposed by the engineers and filling in gaps with new pole line and wire. One of the conditions imposed was that the spacing between loading points should be as near to 41,600 ft. or 7.88 miles as was possible to make it. We were not allowed to have a variation of over 30 ft. in the location of the Pupin loading coils. The engineers required that the entire line be measured and a record made of the actual distance between poles; this measurement being used to accurately locate the loading points and transpositions. The engineers insisted that all measurements should be made of actual wire distance rather than the horizontal distance between poles. It was thus necessary to take into account the contour of the country as well as the sag in the wire in making these measurements. As a result of these new requirements, it was necessary to rearrange and change somewhat more than 50 per cent of all of the loading points and transposition sections on the existing line between New York and Denver. This work, together with the replacing of all existing loading coils on the transcontinental circuits between these two points, covers the principal part of the work in this section.

Between Denver and Salt Lake the work consisted principally of rebuilding the existing pole lines. Such sections of this line as could be used were handled by making a regular pole-to-pole inspection, with replacements and reinforcements in the usual manner. In this distance of 700 miles between Denver and Salt Lake, approximately 200 miles of new pole line cutoffs were built at different points. In addition to the rebuilding of the greater part of the pole line between Denver and Salt Lake, it was necessary to replace the existing No. 12 copper wires with No. 8 wires, replace existing crossarms and string additional No. 8 copper circuits, rearrange all transpositions and place new loading coils.

From Salt Lake City to Wadsworth, Nevada, a distance of 525 miles, it was necessary to build a new pole line and string four No. 8 copper wires, transpose and place loading coils, from Wadsworth to Reno, a distance of 35 miles, rebuild the existing pole line and string four new No. 8 wires, from Reno to Sacramento, 141 miles, re-transpose all existing circuits, string 200 miles of new wire and place loading coils, and from Sacramento to Oakland, 95 miles, re-group and re-transpose all wires and establish loading coils.

The general route to be followed between Wadsworth and Wendover was established by the Pacific Telephone & Telegraph Company in the latter part of 1911. During the latter part of 1913 some further pioneering by the construction forces was done and when in the late fall it was practically determined that the line would be constructed, the survey crews were put in the field between Wadsworth and Wendover. Three crews were started on November 10, 1913, and by March 28, 1914, the entire new pole line of 13,900 poles and 398.3 miles in length had been staked and location of property lines and owners determined.

Definite instructions, however, were not given to commence work until approximately January 1, 1914, at which time orders were placed for poles, wire and other materials, and on February 13, 1914, the actual construction work was commenced, the last pole placed and the last mile of wire strung on June 17, 1914. The work of transposing and loading the circuits was started May 2, 1914, and completed at 8:20 p. m. on July 28, 1914, and at 8:50 a. m., Pacific time, on July 29, 1914, the first telephone conversation between San Francisco and New York took place.

Just to give an idea of the magnitude of the work, the following notes from the construction records are quoted. This applies, of course, only to the work done by the Pacific Company between San Francisco and Wendover, Utah: The total weight of all material used was 5,500,000 lb., of which 730,800 lb. was copper wire. Of the material required for the job there were 13,900 poles, 2000 miles of copper wire, 14,000 crossarms, 700 patent anchors, 58,000 bolts, 56,000 insulators, 90,000 insulator pins. There were employed constantly on the work, 34 wagons, 116 horses, 4 automobile trucks, 1 caterpillar type tractor and several automobiles for the use of foremen.

One of the operations which confronted us and which at first seemed likely to delay the work beyond the time limit set by the engineers for the completion of the line was the digging of holes. After considerable work by our construction forces, a modified form of a post hole digger was built. The use of this apparatus was in a great measure responsible for the rapid work done by the construction forces. Two of these machines were constructed and we found that of the 13,900 holes required for pole 9,730 of them could be dug by this type of machine. The machine dug a

hole 16 in. in diameter, 4 ft. 6 in. in depth, and where soil conditions were exceptionally good, in several cases put down 40 holes in one hour, the holes being located 150 feet apart; this being one hole and a move of the machine 150 feet in 1½ minutes. In one case one of the machines dug 50 such holes in one hour's time. These, of course, were exceptional cases, but the average per machine was 60 holes for a nine hour day, and the highest day's run was 226 holes in 9 hours. The longest continuous run was 13 miles in three days, and skipped but 4 holes.

The distribution of poles was a tremendous task, in that we endeavored to locate the line at least 1000 ft. from any other parallel wires, 300 ft. being the minimum allowance, and on account of cut offs being several miles from unloading points on the railroads it meant the hauling by team to the stake of every pole used. Even with this handicap, we were enabled to distribute in one day by four gangs so employed, approximately 17 miles of poles in 9 hours' time. The best day's record for setting poles for the three gangs so employed was 513 poles in 9 hours, and for one gang, 285 poles; the poles being placed 35 to the mile—this being equivalent to between 8 and 9 miles of poles erected by one crew in one day.

Excellent work was done by the wire stringing crew and the best day's record on the job for the 3 wire stringing crews was 52.8 miles, each crew stringing four wires. In our territory it was necessary to properly place 7,540 transpositions, of which 6,043 were physical or single transpositions, and 1,508 were phantom or double transpositions. Pupin loading coils were placed at 82 points in this line.

The new pole line constructed in Nevada was built of sawed redwood poles, the dimensions being 4x8 top, 8x8 butt, 18 feet in length, the poles having a one way taper.

Time will not permit a detailed narrative of a great many of the adverse conditions that our construction forces encountered, but they included snow storms, rain storms, floods, sand storms, which prevented work for several days at a time, the absence of roads, construction of roads, and great difficulty in obtaining water, food supplies and forage.

INDUSTRIAL USES OF FUEL OIL

BY F. B. DUNN.

Furnace Efficiency.

[Continued.]

Combustion may be defined as the rapid chemical combination of oxygen with carbon, hydrogen or sulphur, accompanied by the diffusion of heat and light. That portion of any substance thus combined with the oxygen is called combustible. The principal combustibles in fuel oil are carbon, hydrogen and sulphur, carbon being the most important.

The amount of air required for combustion is a very important question. Nitrogen is an inert gas and does not aid combustion; it passes through the furnace without change, simply absorbing heat and thus reducing the temperature, being one of the unavoidable sources of heat loss in furnaces. The theoretical amount necessary to supply the oxygen for burning any substance can be computed, but in practice it is impossible to obtain perfect combustion with the theoretical amount of air. The reason for this lies in the fact that it is impossible to bring each particle of oxygen in the air into intimate contact with the particles of the fuel that are to be oxidized, due not only to the dilution of the oxygen in the air by the nitrogen, but also to the fact that the fire is too dense to allow the air to pass through it.

Some engineers claim that from 50 to 100 per cent excess of air is required, depending upon the system and type of furnace used. The accurate determination of just how much is required for any furnace is the most important question for the fireman in charge to answer. A great excess will so lower the temperature of the furnace gases as to delay combustion to an extent that will cause carbon monoxide to pass off unburnt from the furnace. A sufficient amount of carbon monoxide in the flue gases may cause the action known as "secondary combustion," by igniting after leaving the furnace. This injures the breachings and doors, and causes fires in the stack. If less than the required amount of air is supplied, the carbon also burns to monoxide instead of dioxide, and its full heat value is not realized; this is always indicated by the appearance of smoke. The absence of smoke does not necessarily prove that the combustion is perfect, but a clear flame consumes less oil than a smoky one. A dark red flame, slightly smoking, is nearer to complete combustion.

The quantity of heat given off by the union of various substances with oxygen, expressed in British thermal units (B.t.u.) is indicated in the following table:

Hydrogen	burned to	H_2O,	62,032 B.t.u. temp. 5,898 deg. F.
Carbon	"	" CO_2,	14,500 B.t.u. temp. 4,939 deg. F.
Carbon	"	" CO	4,452 B.t.u. temp 2358 deg. F.

The great loss of heat due to incomplete combustion of carbon is shown by the difference between the total heat of perfect combustion of carbon to CO_2 (14,500 B.t.u.), and that of carbon to CO (4,452 B.t.u.).

One pound of carbon, when imperfectly burned produces $12 + 16/12 = 2\ 1/3$ pounds of carbon monoxide. If this quantity of gas is burned to carbon dioxide, the total amount of heat released will be $14{,}500 - 4{,}452 = 10{,}048$ B.t.u.; therefore, the calorific value of one pound of carbon monoxide is $10{,}048/2\ 1/3 = 4{,}312$ B.t.u.

A typical analysis of petroleum is as follows:

Carbon	0.84
Hydrogen	0.14
Oxygen	0.02
	1.00

Assuming the oxygen combined with its equivalent of hydrogen in the form of water, the calorific value would be based upon the corrected quantities as follows:

Carbon	.84	× 14,500 =	12,180
Hydrog.en	.1375	× 62,032 =	8,529
Water	.0225		
	1.0000		20,709

B.t.u. = the calorific value of one pound of oil when its carbon is burned to CO_2

If, however, combusion is imperfect and the carbon only burns to CO, then the total heat would be:

$$.84 \times 4{,}452 = 3{,}739$$
$$.1375 \times 62{,}032 = 8{,}529$$
$$12{,}268 \text{ B.t.u.}$$

or about 59 per cent of that obtained in the first instance. In fuel oils having a lower percentage of hydrogen, the proportionate loss would be greater.

The following test was recently made on board a large ocean-going steamer in order to determine the furnace efficiency:

Report.

"In accordance with our agreement with you, we have made investigations regarding the furnace efficiency in the boilers of your steamship 'Queen,' and beg to submit the following report:

"'Flue gas samples were obtained from the front connection of each furnace in all of the boilers to avoid possible air leaks in the uptake and to obtain individual furnace conditions and analyses, to determine the percentage of carbon dioxide contained therein, with a view to increasing same to the point of maximum efficiency. Our initial determinations revealed the fact that an unusually high percentage of CO_2 prevailed under ordinary running conditions. This was found to be 10.0 per cent which was soon raised to 11.1 per cent by a few minor changes indicated by the analyses. In one particular case the furnace only indicated 7.0 per cent of CO_2 and an investigation revealed a dirty burner. This burner was immediately changed and the furnace then produced 11.4 per cent of CO_2 without alteration of draft. In another case similar conditions prevailed and the CO_2 content was raised from 9.0 per cent to 13.0 per cent. Two analyses were taken from each furnace in succession to check any error or inaccuracy in the work and to avoid false observations. Except in a few isolated places the firemen seemed to be getting exceptional results, and with the aid of the analyses the inferior fires were soon brought up to normal. The only guides for the firemen, however, are the expansion pyrometer in the stack, and indications of smoke; the latter is deceiving, because one furnace might easily produce all of the smoke, while in an effort to better conditions the firemen would probably alter each furnace. This would ordinarily result in an excess of air in every furnace but one or two.

"'Stack temperature observations were also made during each test with an electric pyrometer, the most accurate method yet devised for high temperature measurements. This temperature varied on different watches and conditions in the fireroom, but in every case where other conditions were nearly the same we found a fall in the stack temperature with an increase in CO_2. The average stack temperature for the trip was found to be 715 degrees F., which is easily 50 degrees lower than the temperature in the front connection where the heat in the gases is no longer available for evaporation. The temperature in the port side of the stack was found to be about thirty degrees lower than in the starboard side under given conditions, showing the effect of the retarders in the port side. But even then the temperature was about 670 degrees under the best conditions for ordinary running.

"'Draft readings were also taken in several cases, and it was found that under normal running conditions the furnaces required a draft of about 0.42 inches of water for proper combustion.

"'The inboard furnace on the forward starboard boiler equipped with the cast iron secondary damper was found to admit of more perfect control and draft regulation than the old type. Almost perfect combustion was accomplished with this burner, as 14.0 per cent of CO_2 was obtained with no indications of carbon monoxide.

"'The following table, together with its graphical representation, will serve to indicate the average results of each day's test:

Time.	(Per Cent) Average CO_2	Engine R.P.M.	Bbl. oil per hr.	Temperature.
5-28-14 Aft.	11.0	84.0	12.94	715
5-28-14 P.M.	10.3	84.0	13.35	740
			13.	
5-29-14 Aft.	10.6	83.5	13.17	730
5-30-14 Aft.	11.6		12.69	700
5-31-14 A.M.	11.0		12.62	720
6-1-14 A.M	11.0	83.0	12.50	730
6-2-14 Afft.	11.8	83.5	12.52	690
	11.6			
6-2-14 Aft.	11.6		12.90	700
6-2-14 P.M.	10.8	75.1	10.48	700
Average for trip	11.18		12.58	715

"'The above table represents the average results of 225 analyses, a number of which were obtained each day during the trip. The oil readings were obtained by a meter in the feed line, which serves only as a rough indication of the fuel consumption; it is bad practice to assume that a meter measures oil accurately.

"'Without indicator cards, it is impossible to determine the oil consumption per indicated horsepower hour; but it can be seen from the table that where conditions are similar there is always an indicated decrease in the oil consumption corresponding to an increase in CO_2 in the flue gases. During one period, when the r.p.m. of the engine was reduced to 75 on the 8:00 to 12:00 p. m. watch, we noted an unusual stack temperature of 550 degrees. This would lead to the conclusion that the boiler capacity is rather low for the power required. A material reduction of draft, whether by retarders or any other means will, in our opinion, result in an insufficient supply of air, and for that reason it seems that the boilers are being crowded when the engine has to turn up to 84 r.p.m.

"'The average CO_2 content of 11.18 per cent only represents a preventable fuel loss of 2½ per cent; with the conditions prevailing in this case, it seems unreasonable to expect better results. A calibration of each furnace with a differential draft gauge would no doubt be of value in better regulation of the fires, but the ordinary type of draft gauge is not suitable to marine work because of the unsteady motion of the ships.'"

The tests described above are those which should be carried out from time to time in any modern boiler plant, to indicate to the man in charge, the efficiency of every day performance. When, however, new boilers are installed, or any radical changes made in the plant, very much more thorough tests should be made, to determine the economy and efficiency of the boilers and auxiliaries.

[To be continued.]

Oil engines in Hongkong are increasing in demand, both stationary and marine, due chiefly to recent improvements in motors permitting the use of crude oil in place of the much more expensive gasoline, and a large development of this trade in the near future may confidently be predicted. Crude-oil motors for irrigation purposes were erected during the year in the Ko Ming district on the West River, near Samshui, and larger engines of similar type were also imported for the use of the Fatshan Electric Supply Company. Oil engines, usually an exact copy of some foreign pattern, are being made locally by the local Chinese engineering firms, who are presumably alive to the growing demand for motive power in a handy form.

FEDERAL WATER POWER LEGISLATION.

BY HENRY J. PIERCE.

(Reasons are here given for changes in the amended Ferris Bill as suggested by the author in the July 3d issue of this journal.—The Editor.)

(Concluded)

Reasons for Suggested Changes.

Italics at end of Section 1.

The last proviso of Section 1 requires that no lease shall be granted until the applicant has secured the water right from the state wherein the project is to be located. In many, if not all, of the states of the West, water rights cannot be granted until beneficial use has been made of the water. Therefore, the power developer would be in the peculiar position of being unable to secure a Federal lease until he had procured a state water right, and, on the other hand, of being unable to secure the state water right until he had acquired and developed under the Federal lease. This difficulty would be well met by providing that the applicant must, previous to securing the federal lease, have initiated water rights under the laws of the state.

Parenthesized matter at end of Section 3.

The Secretary of the Interior should not be given authority in his discretion to permit or not permit the physical combination of hydroelectric plants or transmission lines, because a perfectly lawful combination under the law of the land might be prevented by a Secretary of the Interior. This is a matter which should be left to the courts, and this portion of Section 3 should be omitted.

The proviso at the end of Section 5 would exclude "going concern" as one of the elements of value which cannot be taken into consideration when the property is taken over by the government. Justice of such an exclusion all depends on the framers' meaning of the term "going concern." The Supreme Court decided in the Omaha case (218 U. S. 180) that, propertly interpreted, "going concern" means the product of legitimate cash expenditure. Therefore, the exclusion of "going concern" means confiscation of a portion of the property and under such conditions no prudent investor will pay par for the securities. It is both needless and dangerous to exclude off-hand a set of values which are likely to be thoroughly legitimate.

Parenthesis and Italics at end of Section 5.

The wording of the bill would force the lessee, in the event the property were not purchased by the government or a new lessee, to continue to operate it "upon the terms and conditions in force at the time fixed for its expiration," or, in other words, under such water power laws as were in force at that time. This provision directly violates the standards of well defined and definite security to the investor which is established in other parts of the bill, and in reporting the bill, the committee probably did not realize the real purport of this provision. If the government does not exercise its right to take the property at the end of the lease period, the original lease should continue until the government does exercise this right.

Parenthesis and Italics in Sec. 6.

The bill provides that no lessee may execute contracts for the sale and delivery of electrical energy for periods extending in excess of twenty-five years beyond the fifty-year period of the lease. This gives a margin of seventy-five years for a contract if the same is made at the beginning of the lease term, which would probably be sufficient except for very large and expensive industrial works, such as electrochemical and electro-metallurgical plants; also for railroad electrification and large irrigation systems. All of these would be practically excluded or at any rate deterred by the provisions here discussed. Another serious consideration lies in the fact that at the end of say forty years of the lease period, the lessee would, under no circumstances, be able to enter into contract with a consumer for a period longer than thirty-five years. This is a very practical difficulty which cannot be borne by the hydroelectric industry without serious detriment. It is, so to speak, a placing of shackles upon legitimate and praiseworthy development. The period of permissible contracts extending beyond the lease period should be determined in all cases by the duly constituted authorities.

Parenthesis in Section 8.

This item is more difficult of settlement than all the others combined. The others are differences of opinion which may be compromised, but the question of whether the government is entitled to a greater return than other nearby land owners for the use of its land in connection with power development constitutes the fundamental arch upon which the whole bill rests. As the bill reads in the form reported by the senate committee, the Secretary of the Interior is authorized to collect any charge or rental he may specify in the lease for the use of government land in the development of water powers, and he may, in his discretion, base the charges upon the power developed and sold. He may make the charge so high as to be prohibitive, or may favor a lessee with a charge lower than the fair rental value of the land. In the great water power country of Norway, where beyond question the government owns the water powers, there is a fixed annual tax of 27 cents per horsepower for all power generated and used. If, therefore, a federal tax is to be imposed upon the generation of the power latent in the streams contained in the public domain, all power developers should be treated alike and the amount of the tax should be specified in the bill, or if the charge is to be based upon the land, then it should be specified that the charges or rentals shall be "reasonable." The language of this part of the bill as reported by the committee is ambiguous and indefinite, and confers upon the Secretary of the Interior the right to use his discretion in raising revenue, which sovereign authority the constitution gives only to Congress. Worst of all, this clause is a fundamental assumption that federal ownership of land may become a pretext for the control and taxation of water owned by the state. This is wrong in principle. The power is developed by the water which is owned and controlled by the state. The government holds its lands as proprietor and the rentals for its land should be on the basis of land value, as it has always been in the case of land belonging to any other proprietor. In other words, the government should receive suitable remuneration for the use of its land, but is not

entitled to remuneration for the use of water belonging to the state.

In his letter to the House committee on public lands of the 63d Congress in reference to the Ferris bill, the Hon. Franklin K. Lane, Secretary of the Interior, makes the following statement:

"The money returned to the federal government is a matter of minor importance, so long as the maximum development of a given site, the lowest possible rate to consumers and the prevention of monopoly be obtained."

Dr. George Otis Smith, Director of the U. S. Geological Survey, a bureau of the Department of the Interior, testifying before the same committee upon the Ferris bill, said:

"I want to emphasize the fact that I place very little importance upon this matter of revenue to the government. This is not a tax measure; this is a regulatory measure and we must not think of the twenty-five cents or the fifty cents or the dollar as so much revenue to the government."

Mr. E. C. Finney, attorney for the Interior Department, testifying before the Senate Public Lands Committee on the Ferris bill, stated:

"The purpose of the charge is not really to obtain the revenue. That is not the primary purpose. The purpose of the charge is to have a regulative measure."

Thus, as the present Secretary of the Interior and his assistants look upon the revenue derived from the lease of public lands required for development of water powers as a matter of minor importance, why should not the bill state that the charge for use of the land shall be "reasonable," and as the water belongs to the state in which it is located, why not eliminate from the bill the language which carries the assumption that the federal government has the right to tax the use of the water which belongs not to the federal government, but to the state. Any direct tax imposed upon the development of water powers by the federal government, or any indirect tax imposed by them through an exorbitant price for use of government land for power purposes would be a burden over and above and additional to local state, county and municipal taxes. It would be a tax on industry levied not by right, but by might without right. The power producer would not care anything about these extra federal taxes as long as they are not so onerous as to seriously curtail business, as they would necessarily have to be added to the charge for power or electric light to the consumer. The people of the states should not be compelled to pay tribute to the federal government to help maintain unnecessary bureaus at Washington with branch offices in the different states, as would be the case were a federal tax placed upon the development of water powers.

Parenthesis in Section 17.

Section 17 provides that in cases where a lessee proposes to occupy a power site containing five per centum or less of government land, the Secretary of the Interior may, in his discretion, waive such terms of the act as he may think best, and impose such new terms and rentals as he may deem just. This section should be stricken from the bill. Irrespective of the proportion of government land occupied, whether it be five per centum or more, the government should be paid a fair rental for said land based on the land occupied. No such unlimited authority should be delegated to a Secretary of the Interior as this clause would confer.

Italics at end of Section 20.

It would be manifestly unfair to the original lessee to allow others to utilize the land he had leased and the plant he had built thereon for production of power for the purpose of engaging in the same business in competition with him. To cover this defect the words, "and shall not be used for power purposes by any other than the lessee," should be added to the end of Section 20.

Conclusion.

The question is, shall our water powers continue wasting to the sea, and stagnation in their development continue under present faulty laws, or under new laws which shall rob the states of their rights, and lodge them with the bureaus of the federal government at Washington. Or shall we have development of our greatest natural resource under state control and regulation and on fair business terms to capital. The greatest menace to a continuation of the free form of government established by our forefathers through the adoption of the constitution of the United States at the birth of the republic lies in too great centralization of power at Washington, the infringement of the federal government upon state rights, and in the establishment of government inquisition through federal commissions. Only such mild form of government was intended as might be necessary for the regulation and protection of a God-fearing, law abiding people. Our constitution was drawn upon the theory that the citizens of the republic were honest, and not in suspicion that they were dishonest. Would that sincerity in government could equal the simple honesty with which the great majority of business men conduct their affairs. Legislation should encourage business, not hamper it. Government interference stifles the development of the natural resources belonging to the states, and takes from the citizens of the states the impelling purpose to accomplish and achieve.

As Thomas Jefferson well said:

"It is not by the consolidation, or concentration of powers, but by their distribution that good government is effected. Were not this great country already divided into states, that division must be made, that each might do for itself what concerns itself directly, and which it can so much better do than a distant authority.'

To insure the development of our water powers congress should enact laws allowing the use of government lands for power purposes for a reasonable return upon their land value, leaving all matters concerning water power regulation and taxation to the states.

At the invitation of the Oregon legislature, delegates from the twelve far Western states, including their governors, are to meet in Portland September 21, 22 and 23, 1915, to consider the question of federal water power legislation in its relation to the Western states. A clear, firm statement may be expected from this conference, affirming the right of the states to control the use of the water within their boundaries for power development and other purposes.

IMPRESSIONS OF THE SAN FRANCISCO EXPOSITION.

BY W. A. BRACKENRIDGE.

Correlated in my memory and forming a strong and lasting impression are three features of the Panama-Pacific Exposition at San Francisco which, with the other representatives of the Southern California Edison Company, I visited during the recent convention of the National Electric Light Association. These impressions are—the greatest achievements of the art of electric lighting; the universal courtesy and politeness shown by all of the officials and the attaches of the Exposition, and the scrupulous cleanliness which obtained throughout the buildings, grounds and concessions. From the nature of my occupation, the advance in the science of electricity in its varied uses, impressed me forcibly, particularly in the lighting effects which are made a leading feature of the Exposition. It seems almost unnecessary to comment in detail upon the beauty and symmetry of the architecture and grouping of the buildings, as they are probably the greatest which have ever been conceived. Their construction; their design and their portrayal by illustration will occupy an important place in the archives of artistic and mechanical achievement, and will undoubtedly exercise a great uplifting influence as well as a standard of excellence for future generations. The organization of the great force of executives and employes, who handle the enormous number of visitors who daily pass through the portals of the Exposition, is a marvel in administrative perfection. There is an utter absence of the perfunctory, and sometimes surly and impatient mannerism which has characterized guides, porters and policemen at other exhibitions which I have attended. Instead there is a genuine ring of welcome, Western good-fellowship, attentive politeness and painstaking courtesy in their attendance upon the multitude that bombards them with questions and inquiries. Cleanliness carried to the point which challenges the admiration of those who desire to see it exist in the personality; the habits and the work of men as well as in their business surroundings is a rebuke to the slovenly. In complying with a request for my impressions of the Fair I therefore group them, in what seems to be a logical sequence—Light, Courtesy, Cleanliness.—Edison Current Topics.

POTASH PRODUCTION IN CALIFORNIA.

BY THOMAS H. NORTON.

With the cessation in the customary import of potash salts from Germany and the danger of this interruption being prolonged indefinitely, there is renewed interest in the possibility of securing a supply of the much-needed compounds from domestic sources, and especially from our Pacific States. Attempts to develop a domestic potash industry are more advanced in California than in any other section. No less than six companies are actively engaged in this field.

Two companies are seeking to extract potash from mineral deposits. These deposits contain frequently relatively high percentages of potash, but not sufficiently high to warrant transportation without previous concentration. This factor of transportation presents the most serious difficulty in the whole problem, as the chief demand for potash as a fertilizer comes from the eastern half of the country, and very largely from the Gulf States. The California State Mining Bureau expresses strong doubts as to a possible profitable exploitation of the deposits in the southeastern section of the state on account of their remoteness from existing conveniences for transportation.

The most promising source of potash is in the saline deposits at Searles Lake, in San Bernardino County, where the American Trona Company has erected a development plant and is actively investigating the methods proposed for effecting a complete commercial utilization of the vast supply of raw material in sight. The deposits are not only rich in potash, but contain also borax, common salt, sodium sulphate and sodium carbonate. The manager of the company is hopeful of putting potash salts on the market within a few months.

Deposits in the Imperial Valley, to the east of San Diego, are reported as offering some hope of satisfactory commercial development, when projected rail connection is established in 1916. One California company, which has expended $150,000 in studying the possibilities of finding potash in workable quantities in Nevada, has abandoned the quest and reports that there is no promise of ever securing a supply from that state.

It is worthy of note in this connection that active experiments have been conducted by large chemical works in Ohio for the industrial extraction of the potash present in the alunite of Marysville, Utah. These experiments, performed on carload lots, show that the method used is technically satisfactory. The high cost of railroad transportation from Utah to the Atlantic seaboard is at present a serious obstacle in marketing the sulphate of potash obtained in Utah, in direct competition with potash salts of German origin, on the basis of the rates hitherto current. The erection of the requisite plant at Marysville for extracting the sulphate has been begun, and it is probable that a suitable market will eventually be found for the product in the Central States. There is a large consumption of potash salts in the sugar plantations of Hawaii, and this market would also be open to the Utah products. It is stated that powerful fertilizer interests in Chicago are backing financially the effort to exploit the alunite deposits of Utah.

Potash Salts From Kelp.

The utilization of the enormous masses of seaweed growing off the Pacific Coast seems to offer better chances of solving the potash problem. Considerable doubt is expressed by engineers who have carefully studied the methods thus far employed to develop the kelp industry as to the possibility of its becoming a serious factor in the production of potash salts. The leading company engaged in the extraction from kelp is, however, quite confident of its ability to build up the industry on a substantial commercial basis. It is now manufacturing regularly a crude potassium chloride ranging in strength from 85 to 95 per cent of pure KCl. This is all sold for use as a fertilizer. The present output is one ton per day.

Prospective enlargement of the plant will double this output.

The raw material, the giant kelp of the Pacific Coast, is gathered systematically in various ways. One method is to cut the kelp 6 to 8 ft. below the surface of the sea by means of rotating knives. The loosened kelp is allowed to float ashore or brought ashore in barges. By another method the cutting is effected by the aid of reciprocating knives 16 to 18 in. below the surface, and the kelp is conveyed by endless chains upon barges. In a third method the cutting takes place at a depth of 8 to 10 ft. Horizontal knives are used in connection with an underswinging endless chain. The entire cost per ton of wet kelp landed at factories is less than 20 cents.

Wet kelp contains on an average 4 per cent of potassium chlorid. It can advantageously be used as a fertilizer, and is so used to an increasing extent along the Pacific littoral.

Air-dried kelp contains about 15 per cent of potash (K_2O), 2 per cent of nitrogen, and 1.5 per cent of phosphoric acid. It is readily pulverized and is of equal value as a fertilizer with equivalent amounts of potash in the customary form of chlorid and sulphate. Taking all factors into consideration—cost of production, cost of handling, and physical properties—dried powdered kelp seems to be the form in which a substantial commercial demand can be most quickly secured. It will rapidly appeal to the manufacturer of mixed fertilizers.

Preparation of Potash Salts From Kelp.

There is as yet no standard method for extracting the potassium chloride of kelp on an industrially profitable scale. The American Potash Company, which has a plant of some size at Long Beach, uses a "secret process," by which it expects to place upon the market iodine and various other by-products, as well as technically pure potassium chloride.

In kelp potassium chloride and sodium chloride are present usually in the proportions of 3 to 2. They constitute the bulk of the mineral constituents, but are accompanied by small amounts of calcium and magnesium salts and of iodides. The separation of the two chlorides from the organic residue constitutes the chief difficulty to be overcome.

Filtration methods applied to green kelp have not been successful, as the absence of fiber permits much of the organic matter to pass through the filter medium, causing the latter to be quickly clogged. Diffusion methods, similar to those used so satisfactorily in sugar manufacture, have been tried. Thus far they give no promise of industrial application.

More success is indicated by experiments now in progress to coagulate the organic tissues of kelp, and thus permit easy filtration.

It is worthy of note in this connection that a process recently patented in Great Britain offers a new method of overcoming the difficulty mentioned above. According to the British Patent No. 1766, of 1915, issued to Beborg, Testrup and Techno-Chemical Laboratory, kelp is reduced to pulp and then forced by pressure through a heater at a temperature sufficiently high to destroy the slimy, water-binding constituents. The pulp is then cooled and pressed. In its effluent water are found nearly all of the potassium and sodium salts originally present in the kelp, as well as the iodides.

Once removed from the plant, the separation of potassium chloride from sodium chloride is comparatively easy. It is based upon the fact that the potassium salt is much more soluble in boiling water than is the sodium salt, while the reverse is the case at ordinary temperatures. Alternate crystallizations of saturated solutions, first in a hot vat and then in a cool vat, would result in the accumulation of potassium chloride in the latter and of sodium chloride in the former. Concentrated mother liquors could be treated for the recovery of iodine.

Assuming a satisfactory solution of the coagulation problem, this combined industry would produce pure potassium chloride, pure sodium chloride (table salt), potassium iodide, and a cattle food from the residual kelp, containing 4.5 per cent nitrogen.

The area of the kelp beds along our Pacific Coast, including Alaska, is nearly 400 square miles. It is estimated by Government experts that the annual cuttings, including two cuttings per annum off the coast of Southwestern California, would yield 59,000,000 tons of kelp. This is equivalent to 2,300,000 tons of potassium chloride.

The value of this quantity of potassium chloride, if marketed at current rates, would be about $90,000,000. If, however, the kelp crop were dried and sold at current prices for both potash and nitrogen content, its value would exceed $150,000,000.

The imports into the United States of potash salts for the fiscal year ending June 30, 1914, were:

	Tons.	Value.
Muriate of potash (potassium chloride)	237,890	$ 7,915,000
Carbonate of potash	92,000	615,000
Sulphate of potash	45,140	1,898,000
Nitrate of potash (crude saltpeter)	1,580	115,000
Kainit	526,000	2,580,000
Manure salts	261,000	2,757,000
Other potash compounds	.....	978,000
Total	.....	$16,858,000

It is evident that any extended successful development of the industrial extraction of potash salts from the vast kelp beds would ultimately place this country in a position to cover not only the large domestic demand for these compounds, but to meet German competition in other lands, more especially in supplying the wants of countries on the Pacific.

The "potash famine" is already being felt almost as keenly as the "dyestuff famine." Since February 1 but one cargo of German potash has been received in an American port. In the meantime the demands of fertilizer works for their customary supplies have become increasingly insistent.

Potash salts, which sold currently a year ago at $38 per ton, are now quoted at $160 to $175. Over 20,000 tons of potash salts, the property of American firms purchased before the recent embargo on German exports, are now interned on three steamers in German ports. The release of these cargoes is the subject of negotiations between the American and German Governments.

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Street Lighting Progress

The past few months have been marked by a great increase in street lighting installations in Western cities. This has been largely due to a wider recognition of the advantages of better lighting, particularly in making the streets more attractive and thus making for better business in mercantile lines. The influence of the merchants has been a potent factor in getting larger appropriations for street illumination.

The increased efficiency in the larger styles of gas filled incandescent lamps has caused a preponderance of this type of installation. The magnetite and flame arc lamps have kept close pace, and for some purposes are superior, still giving more lumens per watt.

The entry of the gas filled series lamp in this field has been so recent that reliable data as to costs, life and effectiveness are not yet available from a wide enough area to make comparative conclusions reliable. The development of the mazda C lamp has greatly extended the field of incandescent lamps and has also stimulated more active development of the arc lamp.

The days of the 6.6 ampere, alternating current carbon arc are undoubtedly numbered. Higher efficiency magnetite electrodes have been perfected so that it represents the same relative increase in efficincy as between the vacuum and gas-filled incandescents. A new 5-ampere system has been devised and gives promise of wide applicability.

The competition, or rather emulation, between the arc lamp and the incandescent is a perpetual game of see-saw, first one and then the other having the advantage. It is much like the contest between the indelible ink makers and the manufacturers of ink removers or between the irresistible projectile and the impenetrable armor.

For those who are in doubt as to what form of lighting to employ the advice of the street lighting committee of the National Electric Light Association is at least suggestive: "Choose illuminants on the basis of present-day merit and applicability to local conditions, and without reference to the probability of development in the one type exceeding the development in the other type of illuminant."

The Power of Will

Every successful salesman, consciously or unconsciously, appeals to some motive in the mind of the prospective buyer in order to create a desire for the article to be sold. But after the most careful preliminaries of attracting attention, inducing interest and developing desire, many a sale is not consummated because the desire is not strong enough to attain action. Just as a 110-volt current will not start a 220-volt motor under load, so a weak desire will not move the buyer's mind. In order to get action there must be intense desire.

Salesmanship is the process of "stepping-up" an inclination to a wish, a wish to a desire, and finally desire to will, the force which moves the mind to action. Will is thus seen to be high tension desire. A good salesman is a transformer which "steps-up" indifference to will.

Another way of arriving at this conception of a sale is to regard the mind as an exposed photographic plate. No matter how careful the exposure, the image is latent until it has been properly developed. It is even possible to correct a poor exposure by careful developing, adding a little restrainer here and some accelerator there, until finally an intense image is brought forth. The comparison is so obvious as to require no elaboration.

This conception of will as intensified or high tension desire is applicable to many fields besides salesmanship, such as character analysis and character synthesis, or character building. Character building must have for its foundation a strong will rightly directed. To transform an impotent longing into a potent will there should be a nice sense of discrimination between the essential and the non-essential. After deciding what is the most desirable purpose all other desires should be subordinated. The one great desire can be most efficiently attained by denying all distracting and irrelevant desires. Failure comes from not having a strong enough want at hand, sternly within reach, to control the little wishes. Success comes only to those who have the will to succeed, not merely the desire. All this, however, is limited by the person's ability. As long as strength of will and greatness of ability are conjoined there is no limits to achievement. Volition brings about the conjunction. Volition measures the intensity of the desire and the ability to accomplish the desired purpose.

A symbol may be useful in preventing these remarks from becoming as "sounding brass and tinkling cymbals." To the electrical man there is no symbol more useful nor familiar than Ohm's law,—volts equal the product of amperes and ohms. Similarly volition equals the product of action and obstacles. The remarkable resemblance between volts, the force of electricity, in volition, the force of the mind, is a strange coincidence. Amperes, the quantity element in the equation correspond to action and the ohm, the unit of resistance, corresponds to obstacles.

Will, as denoting the faculty of choosing, is passive. Volition as denoting the exercise of that faculty is active. Lecky, the English historian and philosopher, demonstrated that the exercise of the will is the power of concentration, keeping the mind at one thing and using it to govern one's life under the direction of reason. This thought has been well expressed by him in the following words:

"The discipline of thought; the establishment of an ascendency of the will over our courses of thinking; the power of casting away morbid trains of reflection and turning resolutely to other subjects or aspects of life; the power of concentrating the mind vigorously on a serious subject and pursuing continuous trains of thought—form perhaps the best fruits of judicious self-education.

"Its importance, indeed, is manifold. In the higher walks of intellect, this power of mental concentration is of supreme value. Newton is said to have ascribed mainly to an unusual amount of it his achievements in philosophy, and it is probable that the same might be said by most other great thinkers.

"It is in such exercises of will that we chiefly realize the truth of the lines of Tennyson:

"'Oh well for him whose will is strong;
He suffers, but he will not suffer long.'"

Extraordinary Long Distance Communication

A striking example of the value of the transcontinental telephone line, whose construction is so graphically described elsewhere in this issue, was recently afforded in connection with the annual convention of the American Institute of Electrical Engineers at Deer Park, Md. Three papers to be read and discussed at the forenoon session on June 29th, by Frederick Bedell and F. M. Mizushi were devoted to the subject of alternating current wave shapes, distortion factors, harmonics, etc. This subject, important in inductive interference between power and telephone lines, has been extensively studied by the Joint Committee on Inductive Interference appointed by the California State Railroad Commission. Its importance in this respect was not brought out in the papers to be presented. The Joint Committee felt that it should contribute to the discussion, but owing to late receipt of advance copies of the papers, and to the absence of several members from San Francisco the matter could not be taken up actively until the morning of June 28th. The American Telephone & Telegraph Company offered the use of its transcontinental line for the discussion of this subject if desired, and thereby made it possible for the Joint Committee to put its contribution directly before the convention, instead of in the form of a written contribution to the proceedings.

On the afternoon of June 28th the transcontinental telephone circuit was used by Messrs. J. E. Woodbridge and L. P. Ferris at San Francisco, talking with Messrs. H. S. Warren and H. S. Osborne at New York, to make arrangements for the transmission of the contribution. During the night of June 28th the Joint Committee's contribution of approximately three thousand words was forwarded by telegraph over the lines of the Pacific Telephone & Telegraph Company and the American Telephone & Telegraph Company through Pittsburgh to Deer Park, and the contribution was read at the session of the subsequent forenoon.

Owing to peculiar weather conditions at one point in the long line, telegraphic transmission for a time was exceedingly difficult and threatened to become impossible. The Eastern officials were ready with stenographers to take the message by telephone if necessary, but about midnight conditions changed for the better and the message was completed. This incident is a striking example of a practical use in a large way, of one of the engineering feats of this century.

PERSONALS

Walter A. Smith, electrical contractor of Calistoga, Cal., was a recent visitor at San Francisco.

R. H. Sterling is now manager of the Santa Barbara Gas & Electric Company at Santa Barbara, Cal.

C. Remschel has been appointed superintendent of the Southern Sierras Power Company at Perris, Cal.

Geo. Ey of the General Electric Company, Los Angeles, spent the first of the week at San Francisco on business of the company.

L. J. Corbett, professor of electrical engineering at the University of Idaho, at Moscow, is making an extended visit to San Francisco.

Charles W. Price, president of the Electrical Review of Chicago, is in attendance at the International Press Congress at San Francisco.

R. D. Holabird of the Holabird-Reynolds Company, San Francisco, has returned from a trip to Tahoe and the Sacramento Valley, Cal.

Thomas I. Stacey, president of the Electric Appliance Company at Chicago, is visiting California with his family, now being at San Francisco.

W. C. Wurfel, manager of Westinghouse Lamp Company, San Francisco, returned the first of the week after an extended business trip to the East.

M. A. Curran, credit manager of the Western Electric Company at New York City, passed through Seattle en route to Salt Lake City and the East recently.

W. W. Lane, salesman of the Western Electric Company, Los Angeles, who was on a business trip to San Francisco, returned home the latter part of the week.

John A. Britton, vice-president and general manager of the Pacific Gas & Electric Company, leaves San Francisco this week for a brief ocean trip to Japan.

W. Locke of the construction department of Stone & Webster Company, Seattle, left for home the latter part of the week, after a business trip to San Francisco.

W. A. Blair, manager of the accounting department, Pacific States Electric Company, San Francisco, returned the first of the week from a business trip to Los Angeles.

A. H. Armstrong, assistant engineer in the railway and traction department of the General Electric Company at Schenectady, N. Y., is visiting the Pacific Northwest on business.

N. K. Cooper of the sales department Westinghouse Electric & Manufacturing Company, San Francisco, returned Monday after a two weeks' trip to San Diego and the southern part of California.

C. F. Soderbaum, assistant chief engineer United Swedish Electric Company, of Ludvika, Sweden, is making a study of California hydroelectric plants in the interest of the Swedish government.

Thomas Finigan, vice-president Pierson, Roeding & Co., San Francisco, and **George R. Murphy**, treasurer, are taking a two weeks' automobile trip to Yosemite Valley, being accompanied by their wives.

F. F. Skeel, sales manager of Crouse, Hinds Co., Chicago, who has been on a business trip of the Pacific Coast for the past several weeks, arrived at San Francisco from Los Angeles the latter part of the week.

E. P. Dillon of the railway and light department of the Westinghouse Electric & Manufacturing Company, who recently spent several days at the Panama-Pacific Exposition, was a recent Seattle visitor en route East.

C. E. Hardy has resigned as industrial engineer with the San Francisco office of the Westinghouse Electric & Manufacturing Company, to become chief of the electrical department of the City of Oakland, California.

J. J. Gibson, manager of the detail and supply department Westinghouse Electric & Manufacturing Company, East Pittsburgh, passed through Seattle on his way East from the Panama-Pacific Exposition recently.

J. G. Scrugham, professor of mechanical engineering at the University of Nevada, was a member of the official party which attended the dedication of the Nevada State Building at the Panama-Pacific International Exposition this week.

T. W. Simpson, vice-president and Western district manager for the Federal Sign System (Electric), has opened district offices in the Crossley Building, San Francisco. **Robert Johnson** has been appointed manager of the San Francisco sign department of the company.

Russell H. Ballard, secretary and assistant general manager of the Southern California Edison Company, who was honored by an election as vice-president of the National Electric Light Association at its thirty-eighth annual convention at San Francisco early in June, has, with the exception of a short interval, been identified with the interests now incorporated under the above title since 1897. Coming to Los Angeles

Russell H. Ballard.

from the General Electric Company as a young man 23 years old, he entered the employment of the Westside Lighting Company, the predecessor of the Edison Electric Company, as bookkeeper. In 1890 he accepted a position as cashier and office manager of the Butte Electric & Power Company of Butte, Montana, where he remained until 1904. Accepting an offer from the Edison Electric Company to become its auditor, he returned to Los Angeles and entered upon a career which has demonstrated a remarkable ability for organization, untiring energy and a diligence which has made him a recognized master of all of the complicated and perplexing problems which confront the successful operator and executive of a large and progressive electric corporation. Successively, he has advanced through various important positions, from auditor to secretary and assistant general manager. In all of these he has enjoyed the absolute confidence of the officers and directors, his business associates and the men who constitute the organization.

MEETING NOTICES.

Portand Electric Club.

The regular noon day luncheon of the Portland Electric Club was held Friday, July 2. The following new officers were elected: A. C. McMicken, Portland Railway, Light & Power Company, president; A. S. Moody, General Electric Company, first vice-president; Robert Skeen, Skeen Electric Company, second vice-president; F. O. Broili, N. W. Electric Company, third vice-president; Paul Lebenbaum, Southern Pacific Company, fourth vice-president; G. S. Costello, secretary-treasurer, Oregon Building Record.

All except the secretary-treasurer hold office for three months, the secretary-treasurer being elected once a year. A resolution was passed that the luncheon be discontinued during the summer months, to be called together by notice from the new president. The entertainment of the day was furnished by the Home Telephone & Telegraph Company. A short talk was made by Richard W. Montague, attorney-at-law, on "Good Things in Hard Times," also this was followed by the showing of some exceptionally fine lantern slides, showing what can be accomplished by the new color photograph. J. B. Middleton, secretary and manager of the Home Telephone & Telegraph Company, delivered a short lecture in connection with the slides, explaining same. The attendance at the meeting was 50.

The Jovian Electrical League of Southern California.

At the league's last meeting of the season, on June 30th, Ralph B. Clapp, presided as chairman. Chas. F. Scott, former president of the A. I. E. E., was introduced by Dean Geo. A. Damon, as the man who had a dream and then the ability to have it come true through inducing Mr. Carnegie to donate about one million dollars for the erection of the United Engineering Building in New York. Mr. Scott talked about the benefits derived from co-operation among engineering societies, what the engineer has done to bring California into closer relationship with the rest of mankind and the wonderful illumination at the San Francisco exposition. Tribune Pieper announced that about $40 had been collected in fines, to serve as a nucleus for a Christmas charity fund. Announcement was made that the Jovian singers would enter a float in the coming electrical parade and this having been made possible through the generosity of a number of local firms. The Jovian singers, headed by J. M. Morris, rendered a number of songs. The address of the day was delivered by George H. Maxwell, executive director National Reclamation Association on "Our National Defenses—The Patriotism of Peace." The speaker laid stress on the point that the enlargement of the agricultural foundation of the city of Los Angeles is a problem of conserving for irrigation all the flood water that now runs to waste in the Colorado River and in California and Nevada. He showed that the entire area irrigated in Southern California today is only about 500,000 acres, whereas more than 5,000,000 acres could be irrigated within the territory tributary to Los Angeles if all the wasted flood waters were carefully conserved and utilized. A pleasant incident at the close of the meeting was the presentation on behalf of the Edison Company employes of a beautiful floor lamp of latest design to Mr. Marks, who is about to become a benedict, the presentation speeches being made by Messrs. Ballard, Kennedy and Morphy.

Electrical Supply Jobbers' Meeting.

The quarterly meeting of the Pacific Coast Division of the Electrical Supply Jobbers' Association was held at Yosemite National Park, Cal., June 24-25-26, 1915, proving to be not only a most successful but delightful gathering. Some forty-three members and guests were in the party, which also included three central station representatives. The conference comprised four business sessions, two being open meetings, to which electrical men in all branches of the industry were invited. On three occasions papers on subjects directly connected with the electrical industry were presented, followed by general discussions which were generally participated in by those present. Among those eliciting the greatest interest and discussion were papers by F. H. Leggett entitled "Looking the Condition of a Business Squarely in the Face," and "The Value to the Electrical Industry of the Present Day Co-operative Method." The latter being responded to by Messrs. T. E. Bibbins, Geo. C. Holberton, W. S. Berry and W. L. Goodwin, while R. D Holabird read a paper on the subject prepared by H. C. Reid, which was presented before the Contractors' Association a few weeks previous. A general discussion of the subject in all its phases followed these papers. Between sessions parties were made up for trips from Camp Curry, the convention headquarters, to the various points of interest in the Valley, including, Vernal, Nevada and Yosemite Falls, Clouds Rest, Glacier Point, while the ambitious got up before breakfast for a hike to Mirror Lake to witness sunrise on its placid waters. Evenings were crowded with amusements, including dancing, theatricals, lectures on the valley illustrated with slides and moving pictures and moonlight trips to Yosmite Falls for a view of the lunar rainbow. A list of those in attendance follows:

Mr. and Mrs. T. E. Burger, Western Electric Co.
Mr. and Mrs. H. V. Carter, Pacific States Electric Co.
Mr. and Mrs. A. H. Elliott, son and daughter Sec'y Assn.
Mr. and Mrs. Ira J. Francis, John A. Roeblings Sons Co.
Mr. and Mrs. N. W. Graham, Holabird-Reynolds Electric Co.
Mr. and Mrs. F. H. Leggett and daughter, Western Electric Co.
Mr. and Mrs. T. I. Stacey and daughter, Electric Appliance Co.
Mr. and Mrs. Garnett Young, Telephone-Electric Equip. Co.
R. F. Behan, Westinghouse Electric & Mfg. Co.
W. S. Berry, Western Electric Co.
T. E. Bibbins, General Electric Co.
C. H. Carter, Pacific States Eectric Co.
S. W. Gilman, John A. Roeblings Sons Co.
W. L. Goodwin, Pacific States Electric Co.
C. B. Hall, Illinois Electric Co.
Ross Hartley, Pacific States Electric Co.
C. C. Hillis, Electric Appliance Co.
R. D. Holabird, Holabird-Reynolds Co.
Geo. C. Holberton, Pacific Gas & Electric Co.
A. C. McMicken, Portland Railway, Light & Power Co.
J. M. Morris, Westinghouse Electric & Mfg. Co.
Geo. B. Muldaur, Society for Electrical Development.
A. N. Olsen, Electric Railway & Manufacturers' Supply Co.
W. R. Pounder, Hubbard & Co.
Frank J. Quinn, Manhattan Electric Supply Co.
Paul Smith.
H. B. Squires, H. B. Squires Co.
S. V. Walton, Pacific Gas & Electric Co.

PANAMA-PACIFIC A. I. E. E. CONVENTION.

The Meetings and Papers Committee of the Institute has been actively engaged for some time in preparing the technical program of the Panama-Pacific Convention and has tentatively accepted the following papers for the convention program:

Submarine Telephony and Telegraphy, by Bela Gati.

Automatic Telephone System of Los Angeles, by W. Lee Campbell.

Transient Voltages, by F. W. Peek Jr.

Arc Phenomena, by Alfred G. Collis.

Experiences with Diesel Engines Driving Generators in Mine Work, by Charles Le Grand.

Electrically Driven Compressor Plants, by L. E. Alexander.

The North Butte Hoisting Plant, by Wilfred Sykes.

Central Stations for Mine Loads, by Martin H. Gerry.

Overhead Electrolysis and Strain Insulators, by S. L. Foster.

Standard Marine Installations, by H. A. Hornor.

Commutation, by B. G. Lamme.

Delta Cross Connections in Polyphase Systems, by G. P. Roux.

Harmonics in Transformer Magnetizing Currents, by J. F. Peters.

Train Lighting, by R. C. Lanphier.

Experimental Researches on Skin Effect in Conductors, by Messrs. Kennelly, Laws and Pierce.

Abnormal Voltages in Transformers and Type of Winding Which Is Immune From Such Voltages, by J. Murray Weed.

Peak or Crest Voltmeters, by Clayton H. Sharp.

What Constitutes Working Capital—a Symposium, collected by William B. Jackson

NEWS OF CALIFORNIA RAILROAD COMMISSION.

The commission has issued an order extending the time within which the Pacific Light & Power Corporation may issue 19,430 shares of first preferred six per cent cumulative stock and $4,382,000 of first and refunding mortgage bonds from June 30, 1915, to June 30, 1916. Permission was given the corporation to issue these securities on September 21, 1914. A supplemental order authorizes the company to execute an amended trust agreement to Mortimer M. Buckner, Trustee, securing $2,338,000 of 6 per cent two year gold notes.

The commission has issued an order authorizing the San Diego Consolidated Gas & Electric Company to reimburse its treasury from the $24,000 premium of the sale of common capital stock of the par value of $240,000. This reimbursement is for capital expenditures for boilers, generators, transformers, et cetera, to the amount of $24,421.99.

The commission has issued an order authorizing the transfer of the telephone franchise in Emeryville, Alameda county, from the Bay Cities Home Telephone Company to the Pacific Telephone & Telegraph Company.

The Commission has issued an order authorizing the Western States Gas & Electric Company to issue and sell before June 30, 1916, $255,000 face value of its 30 year 5 per cent first and refunding bonds; to issue and sell $33,000 face value of its 3 year 6 per cent notes due October 1, 1917.

NEWS OF OREGON PUBLIC SERVICE COMMISSION.

Under date of July 1 the Railroad Commission of Oregon officially changed its name and became the Oregon Public Service Commission, in accordance with legislative enactment. There is no change in the jurisdiction of the commission, which acquired authority over public service corporations by a law approved by the people under the referendum in November, 1912.

The commission has pending the valuation of three of the great electric and power companies of the state—Portland Railway, Light & Power Company, in Portland and the Willamette Valley; the California-Oregon Power Company, operating various plants in Southern Oregon, and the Eastern Oregon Light & Power Company, covering numerous cities and towns in the eastern part of the state. Valuation investigations in each of these cases are nearing completion. Another utility valuation of large magnitude under way is that of the Pacific Telephone & Telegraph Company, which serves more than half of the telephone users of the state.

The commission has ordered that the electric rates of the Bend Water, Light & Power Company be established at a maximum of 12c per kw.-hr. for lighting and 7c per kw.-hr. for power. Flat rates are allowed on a basis of 0.8 cent per watt per month for lighting.

NEWS OF IDAHO PUBLIC SERVICE COMMISSION.

The commission has handed down a ruling that the proposed consolidation of the five big hydroelectric power companies of southern Idaho is not in violation of the Sherman anti-trust law, nor of the public utilities act of Idaho. On the contrary the commission expresses the opinion that such a consolidation is in the best interests of the state and those who have invested their money in the public utility companies. The companies to be included in the merger are the Idaho Power & Light Company, the Idaho Railway Light & Power Company, the Idaho-Oregon Light & Power Company, the Great Shoshone & Twin Falls Water Power Company, and the Southern Idaho Water Power Company. As one of the steps in this merger the Idaho Railway, Light & Power Company and its property, assets, rights, licenses, franchises, etc., were sold on June 14th at public auction to the Electric Investment Company of New York, for a consideration of $4,500,000. The Electric Investment Company is the purchasing corporation of the National Securities Corporation of New York, which is to be the temporary parent company of the five big hydroelectric power companies of southern Idaho now being merged. This company has also bid in and taken over the property of the Idaho-Oregon Power & Light Company, which was sold at public auction.

The city attorney of coeur d'Alene, Idaho, has been instructed to apply to the commission for a permit to construct, operate and maintain an electric light and water works system.

TRADE NOTES.

The Inter-Mountain Electric Company of which. C. B. Hawley is president and general manager, has purchased the stock and business of the Bertram Motor Supply Company of Salt Lake City, and is adding an automobile supply department to its rapidly expanding business. Finding its present quarters too small, the company has leased the entire frontage of the Newhouse Block on Fourth South street, between Main street and State street, having a total frontage of 125 feet, and a floor space of 11,375 sq. ft. They will occupy the new quarters on August 15th.

The Utah Power & Light Company has engaged the services of Miss Mary Gray Marston, an electric range expert of New York City, who is giving a series of exhibitions throughout the various divisions and districts served by them. Miss Marston's talks are purely educational in their nature, the company believing that if the housewives can be educated to appreciate the simplicity, quality and economy of electric cooking, that they will not be slow to take it up. The women, and many of their husbands, are evincing a keen interest in these exhibitions wherever they are given, and there is every indication that the development of the electric cooking field in the company's territory will be a rapid one.

The Utah Power & Light Company has consolidated all of the offices in their Salt Lake Division in its handsome new office which occupies the north half of the ground floor of the Kearns Building at 132 Main street. Heretofore its commercial office and electric shop have been located at 154 Main street, and the lines and service department, and other operation departments in the old office building at 133 South West Temple Street. The new arrangement will enable the company to render much more prompt and efficient service to its patrons. The new quarters occupy a floor space of 40 ft. by 180 ft. with balconies on the front and rear end of the room. The front part of the main floor is given over to an electric shop and display room, the principal feature of which is a complete line of electric ranges of the principal range manufacturers. The main office is reached through a commodious entrance on either side of which are capacious display windows. The rear portion of the main floor is given over to the commercial office and accounting department. The offices of the division general manager, D. C. Green, and the sales superintendent, B. W. Mendenhall, are located on the front balcony. The office of William Scott, superintendent of lines and electric service is located on the rear balcony, the two being connected by an elevated platform along one side of the main office. A commodious room in the front basement has been fitted up as a demonstration room. An elevated platform in one corner with a hood for carrying away the cooking fumes, sink, refrigerator. etc., supplies all the facilities of a modern kitchen. Special cooking demonstrations may be given there, or an interested prospect may be taken down there by the company's regular demonstrator where the efficiency of electric ranges may be shown the prospect, or where she may prepare food on the range herself should she be interested in doing so. The company's general offices are located on the fifth floor of the Kearns Building, and this recent move places all of the general and local offices in close contact.

NEWS NOTES

FINANCIAL.

PORTLAND, ORE.—Crescent Electric Works, capital stock, $1000; F. Vandivort, M. J. Vandivort and E. O. Stadter, incorporators.

ELLENSBURG, WASH.—The bond issue in amount of $60,000 to finance the municipal light plant for which the contract was recently awarded has been sold to the State Board of Finance at Olympia.

SAN FRANCISCO, CAL.—The Merchants Trust Company is sending to bondholders of all classes of the San Francisco-Oakland Terminal Railways bills of sale covering their coupons, the trust company offering to purchase on the execution of a bill of sale the coupons which were defaulted last week.

FRESNO, CAL.—J. B. Rogers, president of the Fresno Interurban Railway Company, states that only sufficient work to hold the charter will be done on the line until the financial matters are arranged. He says as soon as $25,000 is secured or the interest on that amount the electric line will be rushed to completion as far as J and Merced streets.

LOS ANGELES, CAL.—Purchase of $392,047.50 worth of power bonds has been authorized by the city council, the city government being the investor. The bonds are of the $6,500,000 issue of May 8, 1913, which were voted for the construction of the power plants in the San Francisquito canyon and construction of a transmission line from the plants to this city. The water department lent the power bureau $146,000, which is to be repaid from the money derived from the sale of the bonds, leaving $246,047.50 to be expended in new work. The money for the purchase of the bonds is derived from interest and sinking funds, and by purchasing its own bonds the city will effect a saving of approximately $22,000 a year interest. Further steps will be taken for construction of the transmission line into the city and the purchase of ground in the city for a central distribution plant. Rights of way for part of the transmission line already have been purchased. Pending sale of the remainder of the issue of $6,500,000 bonds, options probably will be taken on rights of way for the remainder of the line.

ILLUMINATION.

CALEXICO, CAL.—F. H. Holt expects to extend gas mains to Calexico this fall.

RIVERSIDE, CAL.—The board of utilities has recommended the installation of a lighting system on North Orange street.

SOUTH SAN FRANCISCO, CAL.—The Pacific Gas & Electric Company has been granted permission to lay pipe in Aspen avenue.

LOS ANGELES, CAL.—The board of supervisors has passed an order calling an election for the establishment of the Artesia Lighting District.

BLACKFOOT, IDAHO.—The council has decided to investigate several available power sites with a view of installing a municipal electric lighting plant.

WALLACE, IDAHO. The council has granted a 50 year franchise to John H. Wourms and associates for constructing and maintaining a natural gas plant.

VICTORIA, B. C.—The property owners of Mission City will make application on July 20 for the creation of a rural street lighting district on the local improvement system.

LOS ANGELES, CAL.—The board of supervisors has referred bids for improvement work in the Angeles Mesa Lighting District to the lighting committee and county counsel.

WISDOM, MONT.—A movement has been started for the installation of an electric light plant to serve the city with electricity for ornamental street lighting purposes. Estimated cost is $3000.

PATTERSON, CAL.—An election will be held on July 12th to vote on the formation of a public highway lighting district, to be known as Patterson Lighting District of Stanislaus county.

MEDFORD, ORE.—A favorable report on the application of the Rogue River Public Service Corporation for a light franchise for the city has been given by the light committee of the city council.

HOLBROOK, ARIZ.—The board of supervisors will shortly hold a hearing on the application of T. M. Quebedeaux and K. H. Myers for a franchise for the construction of an electric light and power plant.

SPOKANE, WASH.—The city council has approved plans for lighting the concrete bridges of the Northern Pacific grade separation structure. All 60 watt lamps were called for instead of 40 and 60 watt lamps.

LOS ANGELES, CAL.—At a meeting of the board of supervisors the contract and bonds of the Pacific Light & Power Corporation for improvement work in the Homeward avenue and Bell Lighting Districts were approved and signed.

ANACONDA, MONT.—The council has passed a resolution of intention, creating improvement district 65, including Hickory, Locust and Maple streets, and cross streets in the district. The plan is to use one light post with four to each side of the block in the district.

TACOMA, WASH.—A resolution has been passed providing for the installation of a street lighting system, consisting of a cast iron standard with a single globe tungsten lamp thereon, with all necessary transformers and wiring. A hearing will be held July 12.

OLYMPIA, WASH.—The application of George H. Tilden Company for a franchise to string wires for telephone and electric lighting along roads in Thurston county has been rejected. They have entered another application to include lights. The hearing will be held July 26.

LOS ANGELES, CAL.—Ornamental street lighting contracts have been let for the ensuing year by the board of public works. The price is 4 cents a kilowatt hour. The contracts are with the Los Angeles Gas & Electric Corporation, the Pacific Light & Power Corporation and the Southern California Edison Company. It is estimated that the cost of lighting the electroliers for the next fiscal year will be $90,000.

LOS ANGELES, CAL.—The Economic Gas Company has contracted for about 10,000,000 cubic feet of gas a day from the La Brea oil and gas fields. This gas will come to Los Angeles through an old pipe line of the Union Oil Company, which has been purchased, and which crosses the gas company's mains about four times, chiefly in the industrial section. The rate for this gas will be 64½ cents per 1000 cubic feet, with a sliding scale of rates for industrial consumers.

BRIGHAM CITY, UTAH.—The municipal plant of this city has recently passed a regulation requiring all customers to install meters. The municipal electric plant has been operating here for several years on a flat rate basis, but it was found that the plant's transmission and distribution lines were kept loaded by the extravagant and needless use of current by the patrons, which rendered it difficult if not impossible to give good service. The installation of meters is being done under the supervision of the city electrician, Mr. Julius Wright, and will require about two months, after which time all flat rate service will be discontinued.

TRANSMISSION.

ASTORIA, ORE.—The Pacific Power & Light Company will probably be permitted to extend its lines over Franklin avenue.

WALLULA, WASH.—The Pacific Power & Light Company is constructing a pole line to connect with the power house at Attalia.

COLVILLE, WASH.—George E. Meyers of Spokane has leased the Stevens County Power & Light Company on Meyers Falls in the Colville River and will operate same.

PASADENA, CAL.—The city commission has adopted a resolution ordering the improvement of Mentoria Court with underground conduits, connections, etc., for carrying light, power and other wires.

SEATTLE, WASH.—J. D. Ross, superintendent of lighting, is making an effort to find a developed power site for the city, one that can be purchased with utility bonds authorized by the council and not by the voters.

HOOD RIVER, ORE.—A permit has been issued to August Guignard, Hood River, by State Engineer Lewis of Salem, for an appropriation of 400 second feet of water from the Hood River for the development of 2273 horsepower at a cost of $300,000.

PORT ANGELES, WASH.—A franchise has been granted to J. L. Keeler of Sequim, Wash., permitting the erection and operation of a transmission line for the distribution of electrical energy for light and power purposes along the highways between Sequim, Dungenes and Port Williams.

PORT ORCHARD, WASH.—The Bremerton-Charleston Light & Fuel Company has applied to the board of county commissioners of Kitsap county for the privilege and authority to establish and maintain a line of electric poles, wires, etc., along the county highways and streets on Bainbridge Island.

PLACERVILLE, CAL.—The Western States Gas & Electric Company plans to increase the capacity of the American River flume, renew the bulkhead on the south side of the American River dam and install an additional 1500 kilowatt generator at the power house, located about five miles north of Placerville. The new improvements will be commenced by November this year.

TRANSPORTATION.

OGDEN, UTAH.—The Ogden, Logan & Idaho Railway Company has recently placed contracts for twelve all steel interurban electric cars for use on its Ogden-Preston line now in course of construction and which will be ready for use in the near future. P. D. Kline, general manager of the Interurban system, has just returned from a business trip to the east. While away he placed contracts for the above mentioned cars, together with a 50 ton electric locomotive, which will be required in the operation of the freight and construction business of the line. He also placed contracts for the machinery for substations of the system to be built at Hot Springs and Deweyville at a cost of approximately $70,000.

TELEPHONE AND TELEGRAPH.

DINUBA, CAL.—The Pacific Telephone & Telegraph Company has been awarded a franchise here.

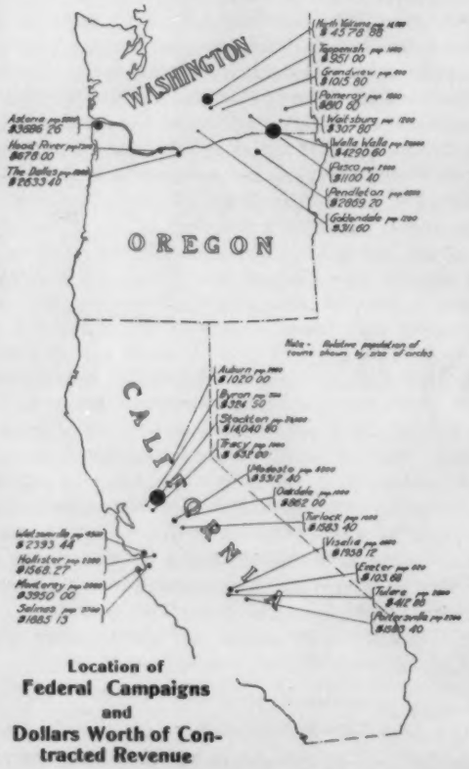
SOUTH SAN FRANCISCO, CAL.—The bid for a franchise from the Pacific Telephone & Telegraph Company has been accepted.

RICHMOND, CAL.—Material has arrived for placing the wires of the Pacific Telephone & Telegraph Company on the principal streets underground.

LOS BANOS, CAL.—The only bid submitted for a telephone franchise was that of the Pacific Telephone & Telegraph Company and the franchise was sold to the company.

ANAHEIM, CAL.—The board of supervisors has granted the application of the Pacific Telephone & Telegraph Company to lay a pipe line in the Garden Grove and Balsa road districts.

The Federal Map



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2. You buy the sign from us with **one** year to pay.
3. The customer's monthly installment on sign purchase **plus his payment for electricity consumed during the month,** often is greater than your monthly payment due us.
4. So after one year you have retired **all** of your investment and still have the sign on the lines bringing you electricity revenue and ⅔ to ⅘ of your investment still coming due.
5. We also secure you against credit loss.

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